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B-1 bomber returns to familiar territory

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10/19/01 – EDWARDS AIR FORCE BASE, Calif. – Ten years after its first round of electronic warfare testing in the Benefield Anechoic Facility at Edwards, the B-1 is back.

Members of the 419th Flight Test Squadron back a B-1 into the Benefield Anechoic Facility here to test a new defensive avionics suite designed to protect the bomber from enemy harm. (Photo by Phil Kocurek) (high-resolution image)

Engineers from the Electronic Warfare Directorate are teaming up with members of 419th Flight Test Squadron at Edwards to test a new defensive avionics suite designed to protect the bomber from enemy harm.

The majority of the original avionics suite is being replaced with a new system that will provide the aircraft with improved electronic combat capabilities and lower maintenance costs. The new system is a combination of parts of the existing defensive avionics suite, a radar-warning receiver and the Integrated Defensive Electronic Countermeasure System, an avionics program the Air Force is sharing with the Navy.

“We are trying to see how it all works together,” said Mickey Brown, Avionics Electronic Warfare Test Division chief. Brown was the lead defensive engineer when the B-1 first arrived in the BAF in 1989. “We want to work out the problems on the ground, where testing is significantly cheaper and test points are easier to duplicate.”

Brown is quick to point out that electronic combat testing in the BAF and in flight comes down to more than money.

“We don’t want our crewmembers to be flying over hostile territory and discover that when they hit the switch, it’s not performing they way they expect it to -- that’s the last place we want them to find that out,” said Brown.

According to Col. Steve Harman, Director of the Electronic Warfare Directorate at Edwards, B-1 testing in the BAF is a perfect example of how the Air Force is working to institutionalize the electronic combat test process.

The process follows a software program from laboratory simulation and its transition into a hardware suite through to its installation on an aircraft. Gathering data along each point, the process continues through ground and flight-testing. Harman said the electronic combat test process is no different from the traditional flight test process in that it allows testers to collect data that offers confidence on how a system is performing.

“We continue to build the fidelity and robustness of each test so that we can then use the data

we have gathered to look back at any point in the overall test process." Harman said. "I believe the result of following this process will yield a better system for the men and women flying that airplane."

Using the BAF's capabilities to simulate a variety of radio frequency signals, a test team can repeat the same test points over and over again for consistency and statistical analysis at the same simulated airspeed and altitude and at the same angle of arrival.

"We will never replace flight test, that's not our job," said Harman. "Our job is to help increase the efficiency and effectiveness of flight test. You can't go out there and test every single electron one by one. In the electronic combat arena we have to simulate as much as possible on the ground."

For Harman, the BAF is a big quiet room that comes to life only when the test team assembles. In the case of the B-1, engineers from the Global Power Bomber Combined Test Force are supplying the test plan. They are working alongside military, government and contractor employees from the BAF as well as from laboratories within Edwards' Integration Facility for Avionics Systems Testing. In addition, experts from the Air Force Electronic Warfare Evaluation Simulator will provide system performance evaluation on the data collected at their hardware-in-the-loop facilities in Fort Worth, Texas.

"It is the people and their experience that add up to better efficiency and a better product for our operational forces," Harman said.

Having the B-1 return to BAF is a homecoming for many involved in this round of avionics testing. Several government and contractor employees were working at Edwards when the B-1 System Program Office laid the groundwork for construction of the facility. The program needed a location where its electronic defensive system could be stretched, said Joe Brown, chief of test operations for the BAF who began working on the facility's original construction plans in 1987.

"When it was built, although the B-1 was the focus, it was understood that the building must be able to do more than just support one aircraft and one military organization," Brown said. "We immediately began an expansion process and even before the B-1 had finished its testing in the facility, the MC-130H Combat Talon II was already beginning testing."

According to Brown, having people who supported the original tests on board today allows the team to draw on the lessons learned from the previous tests.

"With experienced people and added capabilities we are making that room look like the space the B-1 would be flying through if it were in enemy territory," Brown said. "We know how to make it look like the enemy is on to them."

B-1 testing in the BAF is expected to be complete in mid-November.

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